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Adverse reactions to field vaccination against lumpy skin disease in cattle

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Background: Lumpy skin disease (LSD) is an emerging pox disease that can cause serious losses in cattle industry due to decreased productivity, cost of veterinary treatments, death, and impact on the international trade of live animals and animal products. The disease originated from Africa, but it has spread to countries of the Middle East and poses a serious threat to Europe and Asia. Recently, field veterinarians in Jordan reported a range of clinical signs seen after the LSD vaccination in cattle.

Methods & Materials: During the outbreak of LSD in Jordan, farmers outside the outbreak governorate (Irbid) were recommended to vaccinate their cattle of all ages, types and sexes using a sheep pox virus (SPPV) RM65 vaccine, Jovivac. After the vaccination campaign was initiated, post vaccinal reactions were suspected. Affected farms were investigated and data collected about animals on each farm that practiced vaccination against LSD.

Results: Sixty-three dairy cattle farms, with a total of 19,539 animals, were included in the study. Of those, 56 farms reported adverse clinical signs after vaccine administration. The duration between vaccine administration and appearance of adverse clinical signs ranged from 1 to 20 days (Mean = 10.3, SD 3.9). Clinical signs were similar to those observed with natural cases of lumpy skin disease.

These included fever and variable sized cutaneous nodules that could be seen anywhere on the body. Some cattle had swollen lymph nodes, while a few pregnant animals aborted. The percentage of affected cattle ranged from 0.3 to 25% (Mean = 8, SD 5.1). Fever, decreased feed intake, and decreased milk production were seen in 83.9, 85.7, and 94.6% in cattle on the affected farms, respectively. All affected cattle displayed skin nodules over their entire bodies. No mortalities were reported due to vaccine adverse reactions. Duration (course) of clinical signs ranged from 3 to 20 days (Mean = 13.7, SD 4.1).

Conclusion: LSD vaccines can be associated with severe reaction that can be confused with natural infection. Further studies are warranted to identify safe vaccines for this disease.

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Maximizing detection of dengue virus serotypes by a modified reverse transcription-polymerase chain reaction assay in India: presence of co-infection with multiple serotypes

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Background: Dengue surveillance uses reverse transcription-polymerase chain reaction (RT-PCR), although no standardized method for Indian serotypes exists. We compared efficacies of known and modified primer sets targeting envelope (*Env*) and capsid pre-membrane (*C-prM*) genes for detection of circulating dengue virus (DENV) serotypes in southern India.

Methods & Materials: Acute samples from children with clinically-diagnosed dengue were tested for NS1/anti-dengue-IgM. Viral RNA was extracted and two-step nested RT-PCR was done using 3 methods; in the first, consensus primers targeted 654bp of *C-prM* (*CprM654*) with a modified reverse primer; the second targeted 511bp of *C-prM* (*CprM511*), and the third targeted 641bp of *Env* (*Env641*). To ensure accuracy, sequencing (ABI, Applied Biosystems) was done on all RT-PCR-positive samples; DENV sequences were aligned using ClustalW, and compared with NCBI's GenBank database.

Results: Among 162 children (mean age 6.9yrs ± 4.3; males 61.0%) hospitalized between Nov 2014-Mar 2015, 113 were 'dengue-positive' (111 NS1-positive and 2 dengue-IgM-positive), and 49 were 'negative' (undetectable NS1/dengue IgM/IgG). Among 113 positives, PCR detected 84 (74.3%) by *CprM654*, 66 (58.4%) by *CprM511*, and 72 (63.7%) by *Env641*, suggesting high suitability of *CprM654* for regional DENV serotyping. Among 49 'negative' samples, 10 (20.4%) were detected by *CprM654*, 11 (22.5%) by *CprM511*, and 11 (22.5%) by *Env641*. Overall detection rate using all three methods sequentially was 81.4% (92/113) among positive and 38.7% (19/49) among negative samples. Consensus serotype distribution (including multiple-serotype co-infection) was DENV-1 (66, 59.4%), DENV-2 (28, 25.2%), DENV-3 (19, 17.1%) and DENV-4 (1, 0.9%). Co-infections with multiple serotypes were seen in 8 children (4.9%); among these, increased severity and death was seen in one child, and moderate severity in 4 children. Discordant results were seen in 6 (3.7%) samples, signifying either varying sensitivities among RT-PCR methods, or presence of recombinant virus.

Conclusion: This is the first sequencing-confirmed optimization study showing improved detection of circulating DENV serotypes from symptomatic Indian children, using a modified RT-PCR method and a testing algorithm. Our results showed a significant rate of co-infection with multiple serotypes. This method may be used with immediate effect for national dengue surveillance, which